

KOREAN PATENT APPLICATION  
UNDER SERIAL NO. 10-2002-0073207

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KOREAN PATENT APPLICATION UNDER

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IN THE NAME OF: LG ELECTRONICS INC.

FOR: DATA TRANSMISSION MEHTOD ON  
THE MAC LAYER OF MOBILE  
TELECOMMUNICATION SYSTEM

IN WITNESS WHEREOF, I SET MY HAND HERETO

THIS 26TH DAY OF MARCH, 2009

BY



KIM, EUN HEE

[Translation]

PATENT APPLICATION

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Title of the Invention : DATA TRANSMISSION MEHTOD ON THE MAC LAYER  
OF MOBILE TELECOMMUNICATION SYSTEM

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This application is hereby filed pursuant to Article 42 and request for examination is filed pursuant to Article 60 of the Patent Law, respectively.

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[Fee]

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[Attached document ]

1. Abstract, Specification (Drawing) -1 copy

[Abstract]

[Translation]

Disclosed is a data transmission method on a MAC layer of a mobile telecommunication system. The method comprises a first step for transmitting, by each logical channel, a field representing a buffer data amount, and a field representing a data characteristic and an amount of data in a corresponding data characteristic, at the time of transmitting a response field to a transmission channel after receiving a request for a data transmission; and a second step for selecting, by the transmission channel, a transport format combination (TFC) based on priorities of the logical channels and data characteristics.

[Representative view]

FIG. 4

## [SPECIFICATION]

### [Title of the Invention]

Data transmission method on the MAC layer of mobile telecommunication system

### [Brief description of the Drawings]

FIG. 1 is an exemplary view showing a relation between a transmission channel and a logical channel;

FIGS. 2A and 2B are flowcharts showing a data transmission method on a MAC layer of a mobile telecommunication system in accordance with the conventional art;

FIG. 3 is a view showing an interface format between a MAC layer and an RLC layer in accordance with the conventional art;

FIG. 4 is a flowchart showing a data transmission method on a MAC layer of a mobile telecommunication system according to the present invention; and

FIG. 5 is a view showing an interface format between a MAC layer and an RLC layer according to the present invention.

### [Detailed description of the invention]

#### [Object of the invention]

#### [Field of the invention and background art]

The present invention relates to a data transmission method on a MAC layer of a mobile telecommunication system. More particularly, the present invention relates to a data transmission method on a MAC layer of a mobile telecommunication system, in which a transport format combination (TFC) selection is performed based on a

characteristic of data to be transmitted when transmitting data of a plurality of logical channels to a physical channel through one transmission channel on an IMT-2000 MAC layer.

The TFC of IMT-2000 is controlled by a radio resource control (RRC). A layer of a media access control (MAC) performs a TFC selection so that data of a logical channel having a highest priority among a plurality of logical channels can be transmitted as much as possible.

For instance, with reference to FIGS. 2 and 3, will be explained the conventional data transmission method in the case that three logical channels are mapped to a transmission channel as shown in FIG. 1. Here, it is assumed that a fifth logical channel has a highest priority, and a seventh logical channel has a lowest priority.

It is also assumed that the fifth logical channel has no data, and two protocol data units (PDU) exist only at the sixth logical channel.

Firstly, a physical layer interface (PHY), a transmission channel compares a CFN value with a TTI value. If said two values are consistent with each other, a data transmission is allowed. Therefore, the transmission channel requests data transmission from each logical channel. Then, the transmission channel performs a TFC selection based on a data amount and priority informed by the respective logical channels. Since the sixth logical channels have two PDUs, the transmission channel receives the two PDUs.

If a data loss is generated while the two PDUs transmitted to the transmission channel are transmitted through the physical channel, a re-transmission is requested from a peer.

After requesting a data transmission from the respective logical channels, the transmission channel performs a TFC selection based on a data amount and priority

informed by the respective logical channels. Since the fifth logical channel has a highest priority, a TFC selection is performed in a direction that data of the fifth logical channel is much transmitted. Accordingly, more PDUs are input to the fifth logical channel having a higher priority than the sixth logical channel.

Here, once an MAC TFC selection is performed based on a specification, only data of the fifth logical channel is transmitted. This may cause an undesired radio link control (RLC) procedure to occur at the sixth logical channel, or a transmitting system to become deadlocked.

As aforementioned, according to the conventional data transmission method on the MAC layer, a data transmission is performed only on the basis of priorities of the logical channels. Therefore, a specific logical channel of which data has to be transmitted may have an undesired RLC procedure, or a transmitting system may become deadlocked.

[Construction of the present invention]

Therefore, an object of the present invention is to provide a data transmission method on a MAC layer of a mobile telecommunication system capable of stably transmitting data by performing a TFC selection with reference to a priority of each logical channel and a characteristic of data to be transmitted.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a data transmission method on a MAC layer of a mobile telecommunication system, comprising: a first step for requesting a data transmission from each logical channel by a transmission channel, receiving response fields from the logical channels, and receiving

data from a corresponding logical channel by selecting a TFC based on a buffer data amount and priorities of the logical channel on the response fields; a second step for checking whether a transmission error occurs while transmitting data received from the transmission channel over the air through a physical channel; a third step for transmitting a field representing a data characteristic, and an amount of data transmitted to a corresponding characteristic when the respectively channels transmit response fields after receiving a request to transmit data from the transmission channel; and a fourth step for selecting a TFC by the transmission channel based on the priorities and the data characteristic.

The data transmission method on a MAC layer of a mobile telecommunication system according to the present invention will be explained in more detail with reference to FIGS. 4 and 5.

The data transmission method will be explained with taking an example a case that three logical channels are mapped to one transmission channel. Here, it is assumed that a fifth logical channel has a highest priority, and a seventh logical channel has a lowest priority.

It is also assumed that the fifth logical channel has no data, and two protocol data units (PDU) exist only at the sixth logical channel.

Firstly, a physical layer interface (PHY), a transmission channel compares a CFN value with a TTI value. If said two values are consistent with each other, a data transmission is allowed. Therefore, the transmission channel requests data transmission from each logical channel. Then, the transmission channel performs a TFC selection based on a data amount and priority informed by the respective logical channels. Since the sixth logical channels have two PDUs, the transmission channel receives the two PDUs.



If a data loss is generated while the two PDUs transmitted to the transmission channel are transmitted through the physical channel, a re-transmission is requested from a peer.

Here, the transmission channel requests the respective logical channels to transmit data, and then performs a TFC selection based on contents of response fields informed by the logical channels. Here, the TFC selection is performed based on not only priorities of the logical channels, but also data characteristics.

After receiving a data transmission request from the transmission channel, the respective logical channels not only transmit response fields representing a data amount (buffer occupancy: BO) existing in a current logical channel, but also display response fields (IsRetransmitted) indicating that data being currently transmitted include re-transmission data as 'True'. And, the respective logical channels transmit other response fields (Numof Retransmitted) with displaying an amount of data to be re-transmitted thereon (refer to FIG. 5).

In the case that a plurality of logical channels simultaneously request re-transmission of data, the transmission channel performs a TFC selection based on priorities of the logical channels.

[Effect of the invention]

As aforementioned, in the present invention, when transmitting data of a plurality of the logical channels to the physical channel through one transmission channel on the MAC layer, the TFC selection is performed not only based on the priorities of the logical channels, but also based on the characteristics of data to be transmitted. This can allow data to be always transmitted with normal procedures.

What is claimed is:

1. A data transmission method on a MAC layer of a mobile telecommunication system, comprising:

a first step for requesting a data transmission from each logical channel by a transmission channel, receiving response fields from the logical channels, and receiving data from a corresponding logical channel by selecting a TFC based on a buffer data amount and priorities of the logical channel on the response fields;

a second step for checking whether a transmission error occurs while transmitting data received from the transmission channel over the air through a physical channel;

a third step for transmitting a field representing a data characteristic, and an amount of data transmitted to a corresponding characteristic when the respectively channels transmit response fields after receiving a request to transmit data from the transmission channel; and

a fourth step for selecting a TFC by the transmission channel based on the priorities and the data characteristic.

2. The method of claim 1, wherein the data characteristic is data to be re-transmitted.

3. The method of claim 2, wherein a field indicating the re-transmission is displayed as 'true' or 'false'.

4. The method of claim 1, wherein when the respective logical channels have the same data characteristic, a TFC selection is performed based on only the priorities of

the logical channels.

Fig.1

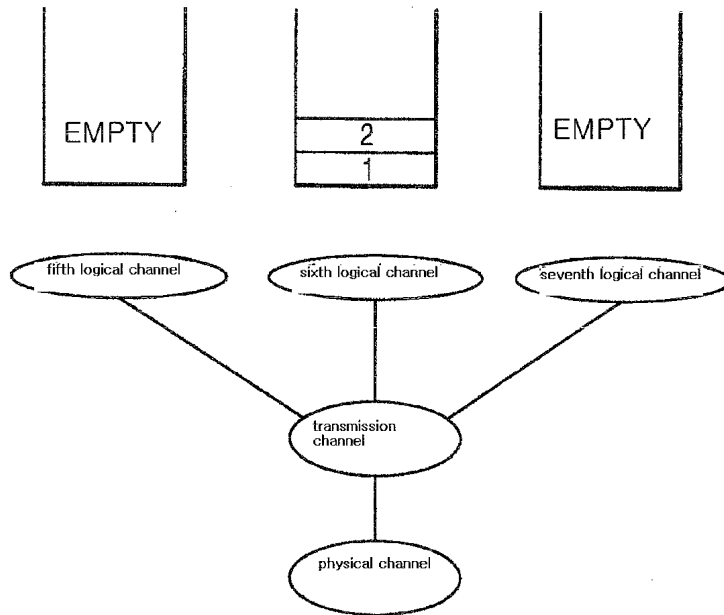


Fig.2a

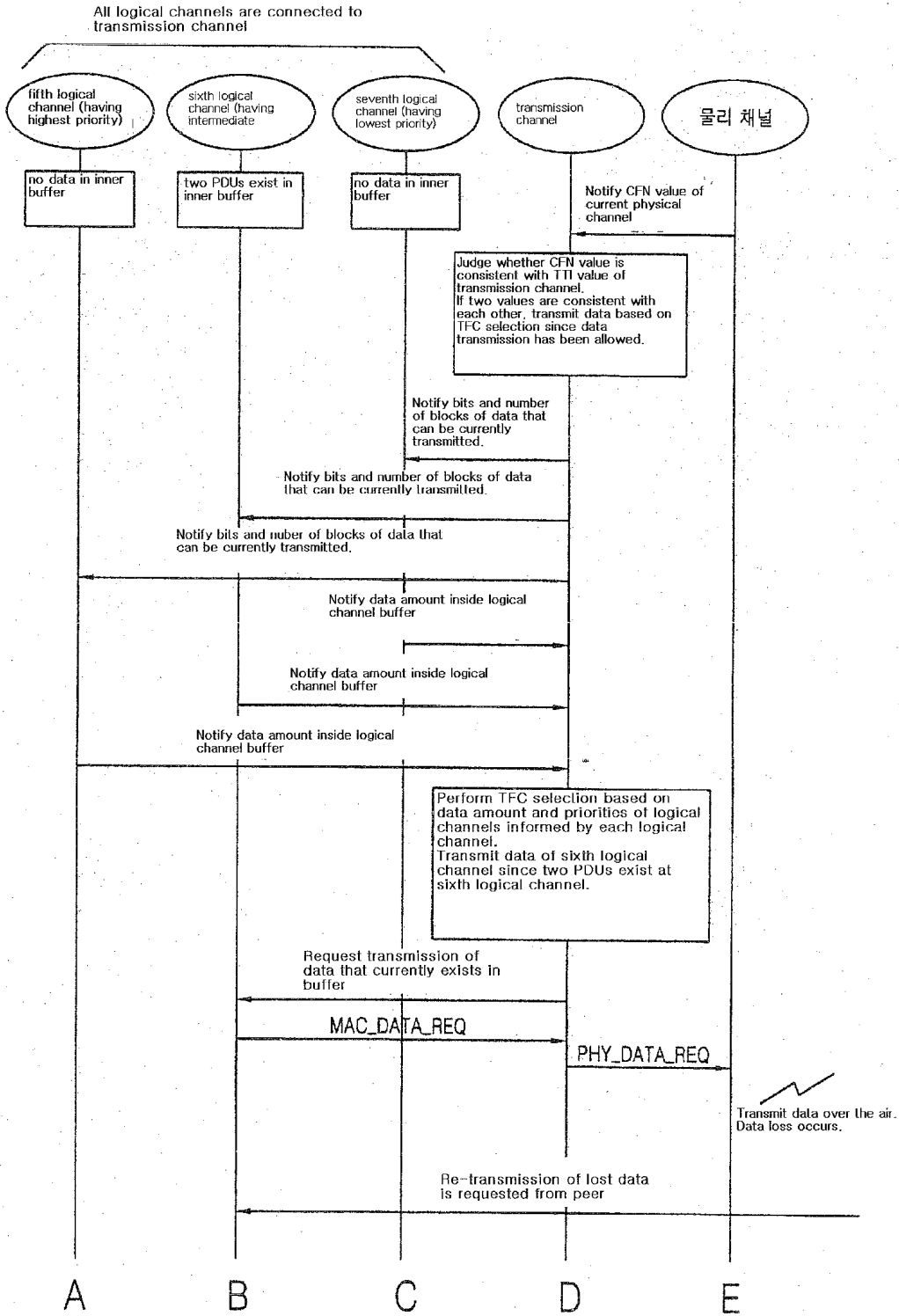


Fig.2b

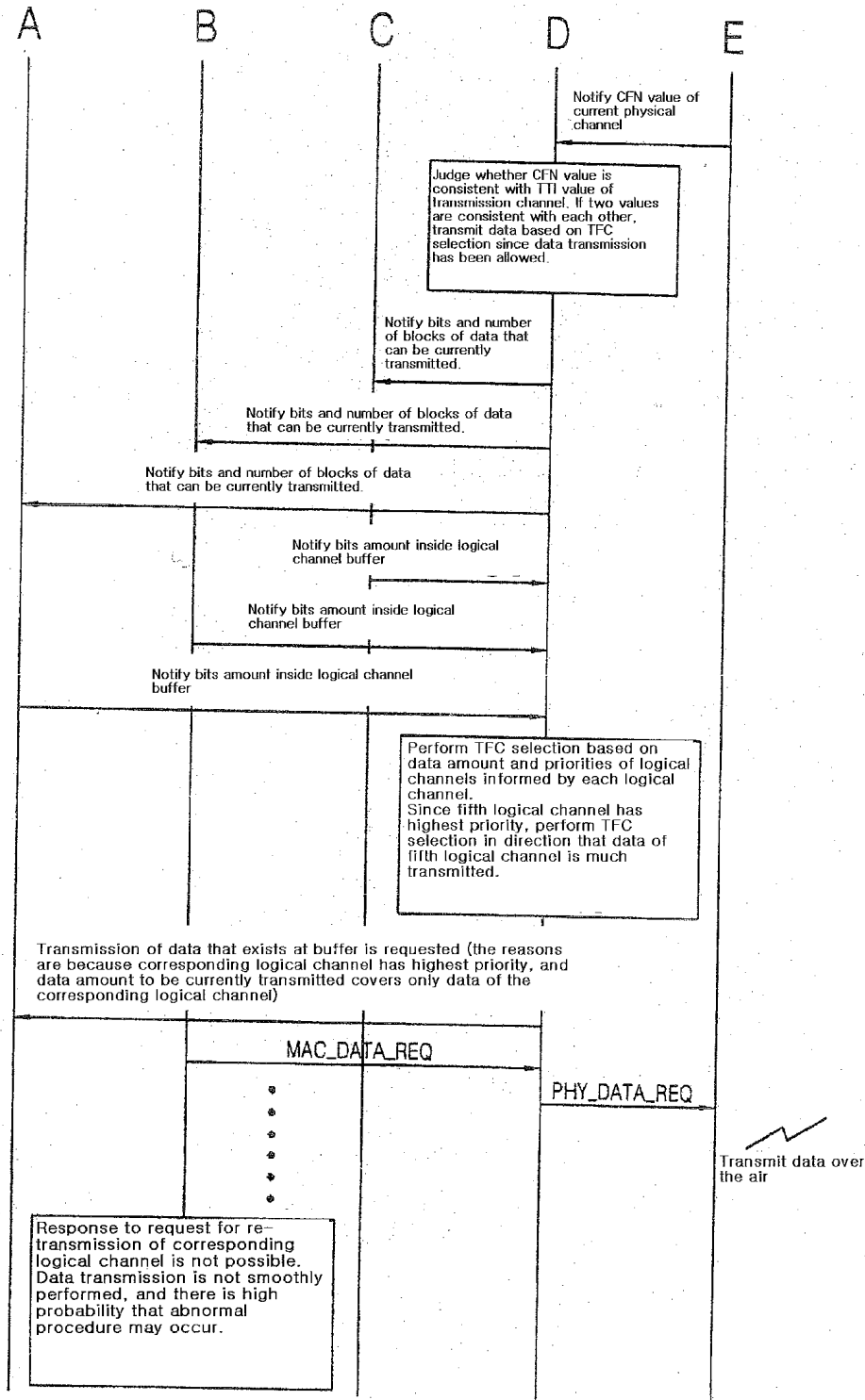


Fig.3

**Primitives between MAC layer and RLC layer**

Generic Name	Parameter			
	Request	Indication	Response	Confirm
MAC-DATA	Data, BO, UE-ID type indicator, RLC Entity Info	Data, No_TB, TD (note), Error indication		
MAC-STATUS		No_PDU, PDU_Size, TX status	BO, RLC Entity Info	
NOTE: TDD only.				

Fig.4

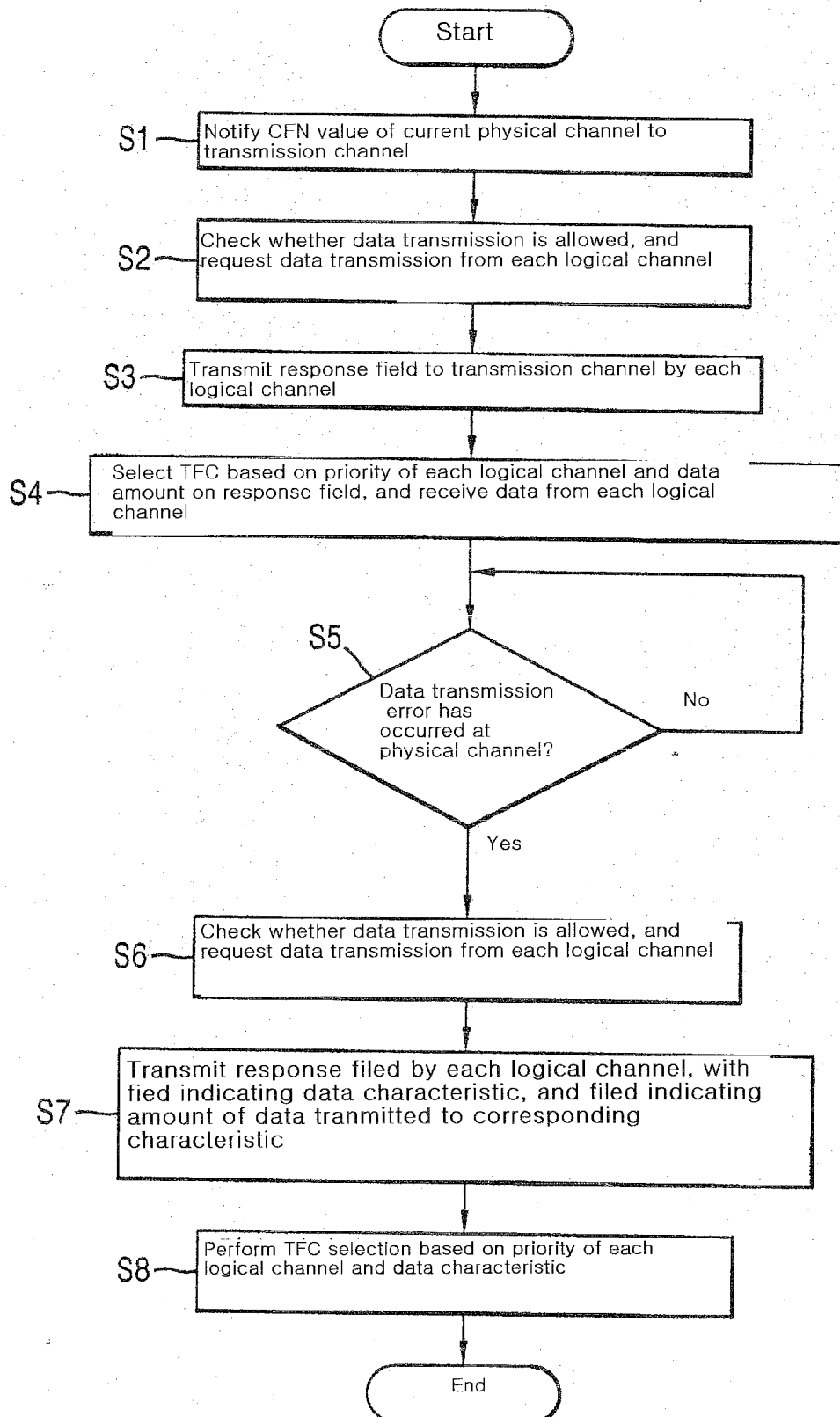




Fig. 5

Primitives between MAC layer and RLC layer

Generic Name	Parameter			
	Request	Indication	Response	Confirm
MAC-DATA	Data, BO, UE-ID type indicator, RLC Entity Info	Data, No_TB, TD (note), Error indication		
MAC-STATUS		No_PDU, PDU_Size, TX status	BO, RLC Entity Info <u>IsRetransmitted</u> <u>Numof Retransmitted</u>	
NOTE: TDD only.				

IsRetransmitted : Data being currently transmitted includes data to be re-transmitted (display as 'True' or 'False' )

Numof Retransmitted: Display amount of data to be re-transmitted.